

We claim:

~~1. A surface covering or surface covering component comprising:~~

a) a substrate and

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b) a substantially homogenous top coat overlying the substrate, the top coat being formed from a radiation curable composition, the top coat comprising an exposed surface that includes a first region with a first concentration of a gloss controlling agent and a second region with a second different concentration of the gloss controlling agent,

whereby the exposed surface of the top coat adjacent the first region has a first gloss level and the exposed surface of the top coat adjacent the second region has a second different gloss level.

2. The surface covering or surface covering component of claim 1, wherein the topcoat directly overlies the substrate.

3. The surface covering or surface covering component of claim 1, wherein the top coat includes or is in contact with a cure altering agent selected from the group consisting of photosensitizers, accelerators and inhibitors.

4. The surface covering or surface covering component of claim 1, wherein the radiation curable composition comprises a flattening agent.

5. The surface covering or surface covering component of claim 1, wherein the radiation curable composition is continuous and overlies the entire substrate.

6. The surface covering or surface covering component of claim 1, wherein the first region and second region are localized adjacent one surface of the topcoat.

7. The surface covering or surface covering component of claim 1, wherein the gloss controlling agent is selected from the group consisting of a thermal initiator, photoinitiator, a cure altering agent and mixtures thereof.

8. The surface covering or surface component of claim 1, wherein the gloss controlling agent is a first thermal initiator, and the topcoat composition comprises a second thermal initiator.

~~9. A surface covering or surface covering component comprising:~~

a) a substrate and

b) a top coat comprising a first region having a first gloss level and a second region having a second gloss level different from the first region, the top coat overlying the substrate,

wherein the top coat is formed from a UV-curable composition comprising a UV curable component and a flattening agent and

wherein the different gloss levels are achieved by curing the UV-curable composition using a first polymerization condition in the first region and a second different polymerization

condition in the second region.

10. The surface covering or surface covering component of claim 9, wherein the topcoat directly overlies the substrate.

11. The surface covering or surface covering component of claim 9, further comprising a patterned layer between the substrate and the top coat, wherein the patterned layer includes a pattern of a gloss controlling agent selected from the group consisting of a photoinitiator, a thermal initiator, a cure altering agent, and mixtures thereof, and the patterned layer is in contact with the UV-curable composition before the UV-curable composition is cured.

~~12. The surface covering or surface covering component of claim 9, further comprising a patterned layer between the substrate and the top coat, wherein the patterned layer includes a pattern of a gloss controlling agent selected from the group consisting of a thermal initiator, cure~~

~~altering agents, and mixtures thereof, the patterned layer is in contact with the UV-curable composition, and the UV-curable composition comprises a ²second thermal curing agent.~~

13. The surface covering or surface covering component of claim 11 wherein the cure altering agents include photosensitizers, accelerators and/or inhibitors.

5 14. The surface covering or surface covering component of claim 11, wherein the patterned layer includes a thermal curing agent.

15. The surface covering or surface covering component of claim 11, wherein the regions of different gloss levels are in register with the patterned layer.

10 16. The surface covering or surface covering component of claim 9, wherein the second polymerization condition takes place after the first polymerization condition.

17. The surface covering or surface covering component of claim 9, wherein the first polymerization condition includes exposure to UV irradiation and/or heat.

18. The surface covering or surface covering component of claim 9, wherein the second polymerization condition includes exposure to EB or UV irradiation.

15 19. The surface covering or surface covering component of claim 9, further comprising a patterned layer that includes a photoinitiator in selected regions, wherein the UV-curable composition applied to the substrate does not include a photoinitiator, and the UV-curable composition is polymerized in register with the photoinitiator in the selected regions by UV irradiation.

20 20. The surface covering or surface covering component of claim 19, wherein the UV-curable composition not in register with the photoinitiator is subsequently polymerized by electron beam irradiation.

25 21. The surface covering or surface covering component of claim 9, further comprising a patterned layer that includes a cure altering agent in the first region, wherein the UV-curable composition applied to the substrate includes a photoinitiator, and the UV-curable composition is

polymerized by UV irradiation.

22. The surface covering or surface covering component of claim 21, wherein the UV-curable composition is subsequently further polymerized by electron beam irradiation or a second UV irradiation under conditions different than the UV irradiation in claim 21 and/or by longer exposure times.

~~23. A method for making a surface covering or surface covering component with regions of different surface gloss, comprising:~~

a) applying a composition comprising a gloss controlling agent to a substrate in a first region to form a pattern,

b) coating the substrate with a UV-curable coating composition, wherein the UV-curable composition includes a UV-curable component,

c) subjecting the coated substrate to a first polymerization condition to polymerize the UV-curable composition in register with the gloss controlling agent in the pattern, and

d) subjecting the coated substrate to a second polymerization condition to polymerize the UV-curable composition not in register with the gloss controlling agent in the pattern.

24. The method of claim 23, wherein the gloss controlling agent is selected from the group consisting of a photoinitiator, a thermal initiator, a cure altering agent, and mixtures thereof.

25. The method of claim 24, wherein the cure altering agent is selected from the group consisting of a photosensitizer, an accelerator, an inhibitor, and mixtures thereof.

26. The method of claim 23, wherein the coated substrate is subjected to the second polymerization condition after being subjected to the first polymerization condition.

27. The method of claim 23, wherein the coating composition comprises a photoinitiator, wherein the first polymerization condition polymerizes the coating composition of the first

~~region in contact with the gloss controlling agent at a rate different than the rate of a second~~
region not in contact with the gloss controlling agent, and subjecting the coated substrate to the
second polymerization condition further cures the coating composition.

28. The method of claim 27, wherein the first polymerization condition includes UV
5 radiation and the second polymerization condition includes electron beam irradiation.

29. The method of claim 23, wherein the gloss controlling agent in the pattern is applied
by screen or rotogravure printing.

30. The method of claim 23, wherein the gloss controlling agent in the pattern is applied
by non-contact techniques.

10 31. The method of claim 27, wherein the gloss controlling agent promotes the UV cure,
and subjecting the coated substrate to UV irradiation increases the rate of polymerization of the
UV-curable components in register with the gloss controlling agent.

32. The method of claim 27, wherein the gloss controlling agent inhibits the UV cure,
and subjecting the coated substrate to UV irradiation decreases the polymerization rate of the
15 UV-curable components in regions of the top coat that are in register with the gloss controlling
agent.

33. The method of claim 23, wherein the coating composition does not include a
photoinitiator, a photoinitiator is sprayed onto the coated substrate in the form of a pattern, the
coated substrate is subjected to UV irradiation in the first polymerization condition to polymerize
20 the coating composition in register with the photoinitiator in the pattern, and the coated substrate
is then subjected to electron beam irradiation to polymerize the coating composition not in
register with the photoinitiator in the pattern.

34. The method of claim 23, wherein the coating composition comprises a photoinitiator,
a gloss controlling agent is sprayed onto the substrate in the form of a pattern after it is coated
25 with the coating composition, the coated and sprayed substrate is subjected to a first
~~polymerization condition including a first set of UV conditions to polymerize the coating~~

~~composition in contact with the gloss controlling agent at a rate different than the rate of~~
polymerization of the coating composition not in contact with the gloss controlling agent, and the
coated substrate is then subjected to electron beam irradiation or a second set of UV conditions.

35. The method of claim 23, wherein the coating composition comprises a photoinitiator,
5 a gloss controlling agent is sprayed onto the substrate in the form of a pattern before it is coated
with the coating composition, the coated and sprayed substrate is subjected to the first
polymerization condition including a first set of UV conditions to polymerize the coating
composition in contact with the gloss controlling agent in the pattern at a rate different than the
rate of polymerization of the coating composition not in contact with the gloss controlling agent
10 and, the coated substrate is then subjected to electron beam irradiation or a second set of UV
conditions.

36. The method of claim 35, wherein the gloss controlling agent promotes the UV cure,
and subjecting the coated substrate to UV irradiation increases the rate of polymerization of the
coating composition in register with the gloss controlling agent.

15 37. The method of claim 35, wherein the gloss controlling agent inhibits the UV cure,
and subjecting the coated substrate to UV irradiation decreases the rate of polymerization of the
~~coating composition in contact with the gloss controlling agent.~~

38. A surface covering component comprising:

- a) a film,
- 20 b) a patterned layer comprising a gloss controlling agent overlying the film,
- c) a top coat overlying the patterned layer, wherein the top coat comprises at least two
areas with gloss levels different from one another and at least one of the areas is substantially in
register with at least a portion of the design of the patterned layer.

39. The surface covering component of claim 38, wherein the patterned layer is
25 discontinuous.

40. The surface covering component of claim 38, wherein the patterned layer further comprises a pigment.

41. The surface covering component of claim 38, wherein the film is a transparent or translucent film.

5 42. The surface covering component of claim 38, wherein the top coat is transparent or translucent.

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~~43. The surface covering component of claim 38, wherein the film comprises a second patterned design applied to either the top or bottom surface.~~

10 44. The surface covering component of claim 43, wherein the design comprises a pigment or a foam controlling agent.

45. The surface covering component of claim 43, wherein a patterned layer containing a gloss controlling agent is in register with the second design on one of the surfaces of the film.

~~46. A method for making a surface covering, comprising:~~

- 15 a) preparing a chemically embossed, mechanically embossed or chemically and mechanically embossed substrate,
- b) applying a gloss controlling agent selected from the group consisting of a photoinitiator, a cure altering agent, and mixtures thereof to the raised portions of the surface of the embossed substrate,
- 20 c) coating a radiation curable coating composition onto the resulting embossed substrate,
- d) subjecting the coated substrate to a first set of conditions to polymerize the radiation curable components in contact with the gloss controlling agent at a rate different than the rate of polymerization of the radiation curable components not in contact with the gloss controlling agent, and

~~e) then subjecting the coated substrate to a second set of conditions to further cure the~~

~~radiation curable composition, and produce a embossed substrate having a differential gloss surface in register with the embossing pattern.~~

47. The method of claim 46, wherein the radiation curable coating composition is coated so as to essentially maintain the embossing detail of the embossed substrate.

5 48. The method of claim 46, wherein the first set of conditions comprises UV irradiation.

49. The method of claim 46, wherein the second set of conditions comprises electron beam irradiation or UV irradiation.

10 50. The method of claim 23, wherein the substrate is embossed, the gloss controlling agent is applied to the raised portions of the embossed surface of the substrate, and the coating composition is applied to the embossed substrate.

51. The method of claim 50, wherein the coating composition is applied to the embossed substrate so that the embossing detail is essentially maintained.

52. A method for preparing a surface covering, comprising:

15 a) supplying a mechanically-embossable substrate,

b) applying a gloss controlling agent selected from the group consisting of a photoinitiator, a cure altering agent, and mixtures thereof to the raised surfaces of an embossing roll,

20 c) mechanically embossing the substrate and transferring the gloss controlling agent to the down areas of the resulting embossed substrate,

d) coating a UV-curable coating composition onto the resulting embossed substrate,

e) subjecting the coated substrate to a first set of UV irradiation conditions to polymerize the UV-curable components in contact with the gloss controlling agent at a different rate than those not in contact with the gloss controlling agent, and

~~f) subjecting the coated substrate to electron beam irradiation or a second set of UV conditions to further cure all regions of the UV curable composition.~~

53. The surface covering or surface covering component of claim 9, wherein the patterned layer is discontinuous.

5 54. The method of claim 23, wherein the gloss controlling agent is a thermal initiator and
~~the UV-curable composition comprises a second thermal initiator.~~